

WHAT IS CLAIMED IS:

1. A method for treating a polymeric optical element which comprises:
  - a) mounting a polymeric optical element into a chamber;
  - b) introducing a compressed gas as an annealing medium into the chamber and annealing the polymeric optical element; and
  - c) removing the annealing medium from the chamber.
2. The method of claim 1, wherein the polymeric optical element is made of an amorphous transparent polymer.
3. The method of claim 2, wherein the polymeric optical element is selected from the group consisting of polycarbonate, polystyrene, poly(methacrylate), poly(methyl-methacrylate), poly(trifluoro-methyl-methacrylate), poly(tetra-propyl-fluoro-methyl-methacrylate, Teflon AF, and cytop.
4. The method of claim 1, wherein the polymeric optical element is a plastic optical fiber.
5. The method of claim 1, wherein the annealing medium is a solvent or non-solvent material for the polymeric optical element, or a mixture thereof.
6. The method of claim 1, wherein the annealing medium is conducted in a supercritical phase, in a liquid or vapor phase approaching the supercritical phase.

7. The method of claim 6, wherein the annealing medium is a material selected from the group consisting of CO<sub>2</sub>, SF<sub>6</sub>, C<sub>2</sub>H<sub>6</sub>, CCl<sub>3</sub>F, CClF<sub>3</sub>, CHF<sub>3</sub>, and isopropanol.

8. The method of claim 1, wherein, in step b), the annealing is performed with a variation of temperature and pressure conditions of the annealing medium.

9. The method of claim 1, wherein, in step b), temperature and pressure of the annealing medium are varied according to a periodic or non-periodic function.

10. A polymeric optical element produced by the method of Claim 1.

11. A method for treating a polymeric optical element which comprises annealing the polymeric optical element in a compressed gas, annealing medium, and recovering the annealed polymeric optical element.

12. The method of claim 11, wherein the annealing is conducted at a temperature of about 10 to 100°C and a pressure of 2 to 200 atm.

13. The polymeric optical element of claim 10 which is a plastic optical fiber having a core and a clad, said core being made of polymethyl methacrylate and said clad being made of a copolymer of methyl methacrylate and tetrafluoropropyl methacrylate.